

## CLAIMS

What is claimed is:

1     1.     A method of synchronizing a data communications network comprising a plurality of  
2     existing nodes forming one or more synchronization domains and a node entering the  
3     network, in which each existing node in a synchronization domain stores a common  
4     representation of the synchronization domain and is configured to flood the synchronization  
5     domain with domain representation information, in which, in a synchronization domain  
6     identification step performed at the entering node, the entering node exchanges entering node  
7     domain representation information with a first neighboring existing node, and identifies as a  
8     first synchronization domain common with the first neighboring existing node all  
9     neighboring existing nodes from which the entering node domain representation information  
10    is flooded back to the entering node.

1     2.     A method as claimed in claim 1 further comprising the step, performed at the entering  
2     node, of exchanging entering node domain node representation information with a second  
3     neighboring existing node not identified as being in the first synchronization domain, if any.

1     3.     A method as claimed in claim 2 in which the entering node exchanges entering node  
2     domain representation information with the second neighboring existing node after a timeout  
3     period following the exchange of entering node domain representation information with the  
4     first neighboring existing node.

1     4.     A method as claimed in claim 2 in which the entering node exchanges entering node  
2     domain representation with all nodes not identified as being in the first synchronization  
3     domain simultaneously.

1     5.     A method as claimed in claim 1 in which the entering node repeats the  
2     synchronization domain identification step successively until all synchronization domains are  
3     identified.

- 1 6. A method as claimed in claim 1 in which the synchronization domain identification  
2 exchange step comprises a synchronization step.
- 1 7. A method as claimed in claim 1 further comprising the step, performed at the entering  
2 node of selecting as the first neighboring existing node the node having the largest store of  
3 domain representation information.
- 1 8. A method as claimed in claim 7 further comprising the step, performed at the entering  
2 node, of requesting domain representation information store size in an initiation exchange  
3 with neighboring existing nodes.
- 1 9. A method as claimed in claim 1 further comprising the step, performed at the entering  
2 node, of suppressing synchronization with neighboring existing nodes prior to the  
3 synchronization domain identification step.
- 1 10. A method as claimed in claim 1 comprising the step, performed at the entering node,  
2 of sending separately identifiable entering node domain representation information to each  
3 neighboring existing node and identifying as respective synchronization domains each set of  
4 neighboring existing nodes from which commonly identified entering node domain  
5 representation information is returned.
- 1 11. A method as claimed in claim 10 in which the separately identifiable entering node  
2 domain representation information comprises a separately identifiable fragment of the  
3 entering node domain representation information.
- 1 12. A method as claimed in claim 10 further comprising the step, performed at the  
2 entering node, of synchronizing the entering node with a neighboring existing node in each  
3 synchronization domain.

1 13. A method as claimed in claim 1 in which the data communications network  
2 comprises a mobile network.

1 14. A method as claimed in claim 1 in which, where a new link appears between the  
2 entering node and the network, the entering node sends entering node domain representation  
3 information via an existing link with a neighboring node and monitors for flooding back of  
4 the entering node domain representation information via the new link.

1 15. A method of identifying synchronization domain candidate nodes in a data  
2 communications network in which each node in the network stores synchronization domain  
3 representation information comprising the steps of comparing the sizes of the  
4 synchronization domain representation information stores and selecting a node having the  
5 largest store as a synchronization domain candidate.

1 16. A computer readable medium comprising one or more sequences of instructions for  
2 synchronizing a data communications network which instructions, when executed by one or  
3 more processors, cause the one or more processors to perform the steps of the method of any  
4 of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15.

1 17. An apparatus for synchronizing a data communications network comprising a  
2 plurality of existing nodes forming one or more synchronization domains and a node entering  
3 the network, in which each existing node in a synchronization domain stores a common  
4 representation of the synchronization domain and is configured to flood the synchronization  
5 domain with domain representation information, comprising means, in a synchronization  
6 domain identification step, for exchanging entering node domain representation information  
7 with a first neighboring existing node, and means for identifying as a first synchronization  
8 domain common with the first neighboring existing node all neighboring existing nodes from  
9 which the entering node domain representation information is flooded back to the entering  
10 node.

1 18. An apparatus as claimed in claim 17 further comprising means for exchanging  
2 entering node domain node representation information with a second neighboring existing  
3 node not identified as being in the first synchronization domain, if any.

1 19. An apparatus as claimed in claim 18 in which the means for exchanging entering  
2 node domain representation information is arranged to exchange said information with the  
3 second neighboring existing node after a timeout period following the exchange of entering  
4 node domain representation information with the first neighboring existing node.

1 20. An apparatus as claimed in claim 18 in which the means for exchanging entering  
2 node domain representation exchanges said information with all nodes not identified as being  
3 in the first synchronization domain simultaneously.

1 21. An apparatus as claimed in claim 17 in which the means for exchanging entering  
2 node domain information repeats the synchronization domain identification step successively  
3 until all synchronization domains are identified.

1 22. An apparatus as claimed in claim 17 in which the synchronization domain  
2 identification exchange step comprises a synchronization step.

1 23. An apparatus as claimed in claim 17 further comprising means for selecting as the  
2 first neighboring existing node the node having the largest store of domain representation  
3 information.

1 24. An apparatus as claimed in claim 23 further comprising means for requesting domain  
2 representation information store size in an initiation exchange with neighboring existing  
3 nodes.

1 25. An apparatus as claimed in claim 17 further comprising means for suppressing  
2 synchronization with neighboring existing nodes prior to the synchronization domain  
3 identification step.

1 26. An apparatus as claimed in claim 17 comprising means for sending separately  
2 identifiable entering node domain representation information to each neighboring existing  
3 node and means for identifying as respective synchronization domains each set of  
4 neighboring existing nodes from which commonly identified entering node domain  
5 representation information is returned.

1 27. An apparatus as claimed in claim 26 in which the separately identifiable entering  
2 node domain representation information comprises a separately identifiable fragment of the  
3 entering node domain representation information.

1 28. An apparatus as claimed in claim 26 further comprising means for synchronizing the  
2 entering node with a neighboring existing node in each synchronization domain.

1 29. An apparatus as claimed in claim 17 in which the data communications network  
2 comprises a mobile network.

1 30. An apparatus as claimed in claim 17 in which where a new link appears between the  
2 entering node and the network, the means for exchanging entering node domain  
3 representation information sends entering node domain representation information via an  
4 existing link with a neighboring existing node and monitors for flooding back of the entering  
5 node domain representation information via the new link.

1 31. An apparatus for identifying synchronization domain candidate nodes in a data  
2 communications network in which each node in the network stores synchronization domain  
3 representation information comprising means for comparing the sizes of the synchronization  
4 domain representation information stores and means for selecting a node having the largest  
5 store as a synchronization domain candidate.

1 32. An apparatus for synchronizing a data communications network, the apparatus  
2 comprising:  
3 one or more processors;  
4 a network interface communicatively coupled to the processor and configured to  
5 communicate one or more packet flows among the processor and network;  
6 and  
7 a computer readable medium comprising one or more sequences of instructions for  
8 synchronizing a data communications network which instructions, when  
9 executed by one or more processors, cause the one or more processors to  
10 perform the steps of the method of any of claims 1, 2, 3, 4, 5; 6, 7, 8, 9, 10, 11,  
11 12,13, 14 or 15.

1 33. A method of synchronizing a data communications network comprising a plurality of  
2 existing nodes forming one or more synchronization domains and a node entering the  
3 network, wherein each existing node in a synchronization domain stores a common  
4 representation of the synchronization domain and is configured to flood the synchronization  
5 domain with domain representation information, the method comprising the steps of:  
6 exchanging entering node domain representation information with a first neighboring  
7 existing node as part of a synchronization domain identification process;  
8 identifying, as a first synchronization domain common with the first neighboring  
9 existing node, all neighboring existing nodes; and  
10 receiving node domain representation information in flooded communications from  
11 all said neighboring existing nodes.  
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